

WHAT IS CLAIMED IS:

- 1 1. A light-emitting apparatus comprising:
2 a transparent base made of an inorganic material;
3 a first and a second bonding pad formed on the base;
4 a GaN semiconductor light-emitting device having a first
5 and a second electrode on one side thereof;
6 a first and a second wire which connect said first bonding
7 pad to said first electrode and said second bonding pad to said second
8 electrode, respectively;
9 a transparent adhesive layer which fixes the transparent
10 substrate of said semiconductor light-emitting device to a first
11 surface of said base;
12 a transparent resin which encapsulates said base, said
13 light-emitting device, said first and second wires, said first and
14 second lead frames, and said adhesive layer,
15 a first and a second lead frame to which said transparent
16 base is fixed so that the substrate of said semiconductor light-
17 emitting device may face the dominant light emitting direction of
18 said light-emitting apparatus, and said first and second bonding pads
19 being electrically connected to said first and second lead frames,
20 respectively.
- 1 2. A light-emitting apparatus according to claim 1, wherein
2 said first bonding pad and said second bonding pad are provided on
3 said first surface of said base, said first lead frame has a first

4 mount facing said dominant light emitting direction, said second lead
5 frame has a second mount facing said dominant light emitting
6 direction, said first bonding pad is fixed onto said first mount with
7 an electrical connection, and said second bonding pad is fixed onto
8 said second mount with an electrical connection.

1 3. A light-emitting apparatus according to claim 1, wherein
2 each of said first and second electrodes is a light-reflecting and
3 electrically conducting metal layer.

1 4. A light-emitting apparatus according to claim 1, wherein
2 said base is made of a material selected from the group consisting
3 of a SiO_2 , sapphire and borosilicate glass.

1 5. A light-emitting apparatus according to claim 2, wherein
2 said base is made of a material selected from the group consisting
3 of a SiO_2 , sapphire and borosilicate glass.

1 6. A light-emitting apparatus according to claim 3, wherein
2 said base is made of a material selected from the group consisting
3 of a SiO_2 , sapphire and borosilicate glass.

1 7. A light-emitting apparatus according to claim 2, wherein
2 said GaN semiconductor light-emitting device is fixed on said first
3 surface of said base between said first and second bonding pads.

1 8. A light-emitting apparatus according to claim 7, wherein
2 said base is rectangular in its plane view.

1 9. A light-emitting apparatus according to claim 7, wherein
2 said first and second bonding pads are formed substantially in
3 parallel with the long side of said first surface.

1 10. A light-emitting apparatus according to any one of claims
2 1 to 9, wherein said base has dispersed therein a fluorescent
3 material.

1 11. A light-emitting apparatus according to any one of claims
2 1 to 9, wherein said base is defined by a plurality of layers, and
3 at least one of said layers contains a fluorescent material.

1 12. A light-emitting apparatus according to claim 10, wherein
2 said base is defined by a plurality of layers, and at least one of
3 said layers contains a fluorescent material.

1 13. A light-emitting apparatus according to claim 1, wherein
2 the first and second bonding pads are formed on a diagonal line of
3 the first surface of the base.

1 14. A semiconductor light-emitting apparatus of flip chip
2 bonding type, comprising:

3 a transparent base made of an inorganic material, which has
4 on one side thereof a first bonding pad and a second bonding pad to
5 be connected to a pair of lead frames with a space between the first
6 and the second bonding pads where a semiconductor light-emitting
7 element is to be fixed.

15. A semiconductor light-emitting apparatus of flip chip
bonding type as claimed in claim 14, wherein the inorganic material
is selected from the group consisting of a SiO₂, sapphire and
borosilicate glass.

16. A semiconductor light-emitting apparatus of flip chip
bonding type as claimed in claim 14, said transparent base is
rectangular in its plane view.

17. A semiconductor light-emitting apparatus of flip chip
bonding type as claimed in claim 14, wherein the inorganic material
has a fluorescent material dispersed therein.

18. A semiconductor light-emitting apparatus of flip chip
bonding type as claimed in claim 14, said transparent base a plurality
of layers, and at least one of the layers contains a fluorescent
material.

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1 19. A pair of lead frames for use in a light-emitting apparatus
2 of flip chip bonding type comprising:

3 a transparent base having on a first surface thereof a first
4 and a second bonding pad and

5 a GaN semiconductor light-emitting device fixed on the first
6 surface thereof,

7 wherein a first lead frame has a first mount which faces
8 the dominant light emitting direction of the light-emitting
9 apparatus and on which the first bonding pad is to be fixed, and a
10 second lead frame has a second mount which faces the dominant light
11 emitting direction and on which the second bonding pad is to be fixed.

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1 20. A pair of lead frames according to claim 19, wherein the
2 first lead frame has a first projection on which diffused light from
3 the light-emitting device is to be reflected toward the dominant
4 light-emitting direction, and the second lead frame has a second
5 projection on which diffused light from the light-emitting device
6 is to be reflected toward the dominant light-emitting direction.

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A2*
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